

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 3, 5, 7, 8, 10, 11, 15, and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. **Claims 1 and 10** recites the limitation "this last artery wall amplitude" in the 13th-14th line of claim 1 and the 12th line of claim 10. There is insufficient antecedent basis for this limitation in the claim.
4. **Claim 3** recites the limitation "processing means for estimating the artery walls motion amplitude along Doppler color ultrasound scanning lines" in the 2nd- 4th line of the claim. There is insufficient antecedent basis for this limitation in the claim.
5. **Claim 5** recites the limitation "the two structures of the artery" in the 3rd line of the claim. There is insufficient antecedent basis for this limitation in the claim.
6. **Claim 7** recites the limitation "the structure location" in the 4th line of the claim. There is insufficient antecedent basis for this limitation in the claim.
7. **Claims 8 and 15** recites the limitation "the interface display" in the 2nd line of the claims, "the segmentation result" in the 5th line of claim 8 and 4th line of claim 15, "the dilation amplitudes of motion" in the 6th line of claim 8 and 5th line of claim 15, "the dilations" in the 8th line of claim 8 and 7th line of claim 15, and "the amplitude of dilation" in the 10th and 12th line of

claim 8 and 9th and 11th line of claim 15. There is insufficient antecedent basis for these limitation in the claims.

8. **Claims 11 and 16** recites the limitation "the method" and "said method" in the 4th-6th line of the claim, and "the quantified parameters" in the 8th line of the claim. There is insufficient antecedent basis for this limitation in the claim.

9. Regarding **claim 11 and 16**, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

10. Regarding **claim 11 and 16**, the word "means" is preceded by the word(s) "circuit" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967). It is necessary for the words which precede "means" to convey a function to be performed. For example, the phrase "latch means" is definite because the word "latch" conveys the function "latching". In general, if the phrase can be restated as "means for x," and it still makes sense, it is definite. In the above example, "latch means" can be restated as "means for latching". This is clearly definite. However, if "circuit means" is restated as "means for circuiting", the phrase makes no sense because the word "circuit" has no functional connotation, and the phrase is indefinite.

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. **Claims 1-11 and 13-16** are rejected under 35 U.S.C. 102(b) as being anticipated by Bonnefous (US 6,647,135 B2). Bonnefous discloses an ultrasonic viewing system comprising a probe which acquires a first image sequence of blood flow velocity color-coded images (Doppler Color sequence) and a second image sequence of wall movement graphics (ultrasonic image sequence of motion amplitude) (col. 3 line 38-45). The wall movement graphics determines from the blood flow velocity color-coded images the arterial wall velocity and amplitude perpendicular to the direction of the blood flow (lines perpendicular to the artery global axis). The displacement of tissue over a time delay between one ultrasonic emission to the next can be estimated and the locations of the arterial walls in corresponding echo amplitude images are determined (col. 6 line 23-31, col. 7 line 35-65). Furthermore the dialation of the artery walls are measured and graphed as a function of time (col. 9 line 38-55, fig. 7). The blood flow velocity image as well as the wall movement graphic image are displayed to the user (col. 2 line 47-59). When creating the images correction of the cosine angle between the vessel axis and the ultrasound beam is performed (compensating for Doppler angle) (col. 5 line 48-51).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. **Claims 1, 5-11, and 14-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Criton (US 5,800,356) or in the alternative rejected as being unpatentable over Criton in view of Sturgill (US 5,170,792). Criton discloses a method and apparatus which captures a Doppler color sequence displaying the velocity of an anatomical structure. A motion tracker tracks the edges of moving structures from one scanline to the next as motion amplitudes (col. 5 line 17-34). The velocities and the movement of the walls are displayed to the user as a function of time allowing for evaluation of the difference of motion of two structures or the dilation of the structure (col. 5 line 52-col. 6 line 25, fig. 6). Although Criton discloses using the system for following heart motion Criton also discloses his system is used for tracking tissue motion in general (abstract). It would therefore be obvious to one skilled in the art to use the invention of Criton on a segment of artery for the purpose of diagnosing problems such as plaque build up in arteries. It is further obvious to use the system of Criton for an artery as it is well known in the art to use a single Doppler ultrasonic devices to measure velocity of both heart tissue and artery tissue as disclosed by Sturgill (col. 1 line 42-45).

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACQUELINE CHENG whose telephone number is (571)272-5596. The examiner can normally be reached on M-F 10:00-6:30.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JC

/Long V Le/
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